

MUNICIPALITY OF MURRYSVILLE
Policy # 20-05

SPECIFICATIONS FOR
CONSTRUCTION AND MAINTENANCE MANUAL
FOR
HIKING, BICYCLING AND CROSS-COUNTRY SKIING
TRAILS

1. INTRODUCTION

This document provides guidelines for the construction and maintenance of trails by volunteers in the parks, nature reserves, or other properties owned by the Municipality of Murrysville; also for Municipal trails located on private lands. Approvals - where indicated - are the responsibility of the Director of Public Works and Parks acting upon recommendations from the Parks and Recreation Commission; in this it is assumed that the area in which the trail will be located is pre-approved for such use, e.g. an existing park or nature reserve that already has trails; or land in a subdivision that has been dedicated to the Municipality; or private land on which the owner has dedicated a right-of-way for a community trail. Excluded from these guidelines are large bicycling trails (such as the Duff Park trail), horseback riding trails, and ADA accessible trails; these require more detailed planning and design and their construction is likely beyond the capability of volunteers.

2. CONSTRUCTION

The following steps provide a logical progression in the process of constructing a trail and reflect the experience - good and bad - with existing trails in Murrysville, which have almost exclusively been built by volunteers.

Step 1. Walk the area and prepare a rough outline of the proposed trail on a contour map. Identify the purpose of the trail (hiking, bicycling, cross-country skiing) and mark points of interest such as vistas, historical markers, special plants or trees, etc. Include a suggested name for the trail and indicate signs and trail markers that will be installed. Identify features that may not be in compliance with this document (e.g. slopes in excess of recommend values) and provide rationale for their inclusion. Submit this outline for approval.

Step 2. Following permission to proceed, establish a detailed routing of the trail in the field; this is preferably done between November and April when the leaves are down. Mark the intended location of the trail with surveyor's tape. Avoid the following:

- Long, straight sections (unless there is an existing path).
- Potential displacement of native plants and trees.
- Inclines that are perpendicular to the contour lines.
- Steep inclines (>15% for hiking; >20% for bicycling; >5% for cc-skiing).
- Narrow switchbacks (these are an invitation to shortcuts)
- Areas prone to drainage problems, e.g. depressions, gullies, wet areas.
- Encroachment within 15 ft. of a stream (except for crossings).

Provide the opportunity to the Director of Public Works and Parks or his designated replacement to inspect the detailed routing of the trail.

Step 3. Clear a 4 ft. wide by 8 ft. height trail space which encompasses the trail plus sufficient room to accommodate one year's growth of the vegetation along the trail; use loppers or a saw as required. Scatter the debris on both sides of the trail; locate the cut ends of small trees and larger branches away from the trail.

Dig up invasive plants within 4 ft. of the trail space, especially multiflora roses. Dispose of these by placing them in trees so that they do not take root again.

Cut down dead trees that may fall onto the trail, thereby endangering users. Leave logs on trails that are to be used for hiking only, but cut out a notch if they are too large to step over (>12 inch). Remove logs on trails that are to be used for bicycling and cc-skiing since they would impede or even endanger the users.

Step 4. Construct the treadway, which should be 2 to 3 ft wide (if the trail parallels a very steep slope this may be reduced to 1.5 ft). Do not dig up stumps, but cut them off as close as possible to the surface of the treadway; the roots will help in stabilizing the surface of the treadway. If filler material is needed, do not use topsoil since it easily washes off; instead rely on base material that can often be found in or near the root mass of toppled trees.

Given the prevailing terrain in Murrysville, most of the trail will parallel slopes of varying steepness; this provides opportunities to channel water off the trail thereby mitigating the potential for erosion of the treadway. For that reason, the following should be adhered to:

- Slope the treadway by 2 to 3 in. towards the downhill side (Figure 1).
- Interrupt trail inclines with dips spaced 30 to 50 ft. apart (Figure 2); make sure that the dips drain readily to the downhill side.
- If dips are not practical, install water bars (Figure 3) using stones or hardwood (locust, oak, ash, etc.) timbers. Prior approval must be sought for the use of treated timbers since they may not be environmentally friendly.
- If locally the incline of a hiking trail exceeds 15 percent, install steps, again using stones or timbers (see above for choice of wood).
- Locate the treadway on the uphill side of an established tree; avoid the downhill side because roots will interfere (Figure 4).
- If narrow switchbacks cannot be avoided, place debris such that shortcuts are uninviting.

Stream crossings are inevitable. In case of small streams (less than 1 ft. wide at late spring level), install a 4 ft. section of pipe (at least 10 in. diameter) and add fill around it; place a few large stones at the outlet of the pipe to break up the flow of water. For larger and deeper streams, options are as follows:

- install steps on both sides to protect the banks from erosion; if necessary, place large stepping stones in the water course itself.
- construct a bridge, preferably a simple one consisting of two parallel beams 2 to 3 ft. apart in the direction of the trail with planks on top; consider the effect of flooding of the stream.
- however, if the treadway is elevated more than 30 in. relative to the normal water surface, municipal regulations require the bridge to have a railing with balusters.

Although wet areas are to be avoided, this may not always be possible. The simplest solution is to place large stepping stones. If this is not effective, other measures such as drainage trenches, pipes below the trail, or a boardwalk should be considered.

Bridges and boardwalks are permanent structures; their design must be submitted to the Municipal Engineer for review and approval. They are excellent candidates for group projects (scouts, churches, etc.).

Step 5. Install blazes which neatly and unambiguously mark the trail such that a hiker unfamiliar with the area can follow it with ease. The following requirements apply:

- Blazes should be 2 in. wide and 4.5 in. tall. They are to be installed at a height of 5 to 6 ft on live trees that are clearly visible and located within 1 to 3 ft. of the right hand side of the treadway.
- Preferably, blazes are to be painted on trees. In case of thick, rough bark...the area for the blaze should first be smoothed with a paint scraper (do not cut through the bark because the tree will "bleed" and cause the paint to run). With smooth trees, simply rub the area with a nylon dish pad or canvas gloved hand to remove dirt, lichen and loose bark. Once the surface is prepared, use latex paint and a template to make the blaze. Follow the directions on the paint container regarding temperature, humidity, etc.
- If it is judged that painted blazes require too much maintenance, approval may be sought for the use of vinyl or aluminum blazes. These should be fastened with two aluminum nails; when installed, the nails should protrude 3/4" to 1" in order to allow for tree growth.
- Use blazes sparingly; generally, no more than a single blaze should be visible from any position on the trail (typically 100 to 150 ft. spacing).
- Place a double blaze (vertically spaced by 4 in.) just ahead of abrupt turns, including those at junctions. Next, place a blaze on the continuation of the trail 25 to 50 ft. beyond the turn such that it is clearly visible from the point where the trail turns.
- If the park or nature reserve has two or more distinct trails, it is recommended that different colors be used for the blazes of each trail.

Once blazing has been completed, the temporary markings using surveyor's tape should be removed.

Step 6. An accurate routing of the trail should be established using a GPS instrument; the trail routing should be added to a detailed drawing of the park or nature reserve, e.g. a survey map.

3. MAINTENANCE

Following are the main items to be inspected and maintained at least once a year:

Trail Space. Reestablish the 4 ft. by 8 ft. space in accordance with the directions given in Step 3 of "Construction" above. Pay particular attention to protruding new growth that poses an eye hazard.

Treadway. Over time, the treadway takes on the shape shown in Figure 5 because of use and erosion. Remove the slough and berm material and reestablish the desired out slope of 2 to 3 inches (refer to Step 4 of "Construction" above). If the area around stumps has been eroded, cut them again to be flush with the surface.

Trees. Treat newly fallen trees in the same manner as described under Step 2 above.

Erosion. Inspect all erosion control devices; clean out pipes and trenches; repair or replace steps and water bars as necessary. Install additional devices such as pipes, trenches or water bars in those areas where excessive erosion has occurred.

Blazes. The following is recommended:

(i) Walk the trail in late summer and make sure that the blazing is adequate; add or relocate blazes as needed. Remove branches that prevent the blazes from being seen.

(ii) Walk the trail in winter when there is snow on the ground. What was an obvious trail in summer may not be so in winter; add blazes, if this is the case.

(iii) Redo painted blazes every 2 to 3 years; replace vinyl or aluminum blazes that are damaged or that are being imbedded in the bark because of tree growth.

(vi) If it is necessary to eliminate blazes because a section of the trail has been relocated, cover painted blazes with a dark neutralizing paint; remove vinyl or aluminum blazes.

4. TRAIL MAP

A trail map should be posted on a sign located in the parking lot(s) near the trail head (the beginning of the trail). The sign should include a telephone number and/or an E-mail address where problems encountered by users of the trail can be reported.

In case of multiple trails within a single park or nature reserve, it is recommended that trail maps be made available to users. These should include the color scheme used for the blazes of the different trails.

5. VOLUNTEERS

Use common sense and respect nature. Dress appropriately for the job at hand and the weather, and wear work gloves. Do not use equipment that may damage the treadway such as tractors. Rely on chainsaws sparingly since the bar oil is a pollutant. Follow safety precautions when using power equipment. And remember that permanent improvements (e.g. boardwalks and bridges) as well as the use of treated wood require prior approval.

6. REFERENCES

Most of the above is based on the following references:

- (1) "Trail Construction and Maintenance Notebook", USDA Forest Service, October 1996 (Revised February 1999).
- (2) " Appalachian Trail Design, Construction, and Maintenance", Second Edition, 2000.

Throughout, the material was condensed and requirements that were judged not to be applicable in Murrysville were deleted. In case of more challenging projects such as the construction of steps and boardwalks it is recommended that these References be consulted.

ATTACHED: DESCRIPTIVE DRAWINGS FOR PROJECTS

THIS POLICY ORDAINED AND ENACTED AT A REGULARLY CONSTITUTED, DULY CONVENED MEETING OF THE COUNCIL OF THE MUNICIPALITY OF MURRYSVILLE, THIS _____ DAY OF _____, 2005

COUNCIL OF THE MUNICIPALITY OF MURRYSVILLE

Lawrence Keller, President

Donald C. Pepe, Chief Administrator

(Seal)

APPROVED/REJECTED:

Joyce K. Somers, Mayor

Dated: _____, 2005

Member	Yes	No	Absent	Abstain
Jack Bankoske				
Robert J. Brooks				
Joan C. Kearns				
Lawrence W. Keller				
Dennis Pavlik				
Theo van de Venne				